

REMARKS

In view of the preceding amendments and the comments which follow, and pursuant to 37 C.F.R. § 1.111, amendment and reconsideration of the Official Action of February 7, 2005 is respectfully requested by Applicants.

Summary

Claims 1 – 30, 34, 35, and 39 - 42 are pending. Claims 1, 2, 5, 6, 13 – 15, 24, 34, and 39 have been amended. Claims 17 and 18 have been cancelled. No new matter has been introduced as a result of these amendments.

Claims 1 – 16, 19 – 30, 34, 35 and 39 – 42 are pending following entry of the present remarks.

Examiner's Comments

The Examiner noted that Claim 17 is confusing because a dependent claim must necessarily include all the limitations of the claims from which it depends, namely Claims 13, 15 and 16. This claim confusion is now moot in view of Applicants cancellation of Claim 17.

Rejection under the Doctrine of Double Patenting

In the outstanding Office Action, Claims 13, 18 – 22 and 34 - 4 and 42 have been provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1 - 20 of co-pending U.S. Patent Application No. 10/103,358, now U.S. Patent No. 6,707,649 B2. The issued U.S. Patent No. 6,707,649 B2 had common inventors and assignee with the instant application. The double-patenting rejections can therefore be overcome by the submission of a Terminal Disclaimer in compliance with 37 C.F.R. § 1.321(c).

Accordingly, a Terminal Disclaimer has been executed for U.S. Patent No. 6,707,649 B2 and is enclosed herewith.

Claim Objections

The Examiner has objected to Claims 5 and 6 because of informalities, in that numbers "10" and "15" are found in Claims 5 and 6, respectively. Accordingly,

Applicants have deleted numbers "10" and "15" from the corresponding claims, and respectfully request that these claim objections be withdrawn.

Claim Objections under 35 USC §112

The Examiner has objected to Claim 39 under 35 USC §112, 2nd paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Applicants have amended Claim 39 to recite that "one of a noble metal material layer composed of a noble metal element and a Cu layer composed of Cu is formed on the nonmagnetic layer in the step (e)." Accordingly, the antecedent basis issue is now moot.

Hence, Applicants respectfully requests that the claim objections under 35 USC §112 be withdrawn.

Claim Rejections under 35 USC §102

The Examiner has rejected Claims 1, 2, 7 - 22, 24, 26 – 30, 34, 35, 39 and 40 under 35 U.S.C. §102(a), (b) and (e) as being anticipated by Kamiguchi et al. (U.S. Patent 6,495,275 B2).

Claim 1 is directed to a magnetic film. The magnetic film is a multilayer film which has a laminate of a free magnetic layer, a nonmagnetic layer, a pinned magnetic layer, an antiferromagnetic layer, and a current that flows perpendicularly to a film plane of each of the layers of the multilayer film.

Thus, the claimed magnetic film is a current perpendicular to the plane (CPP) type of magnetic film. That is, the multilayer film is sandwiched between electrode layers such as current flows in a direction perpendicular to the film plane of each layer of the multilayer film. The Examiner also noted in his illustrating Table 1 in relation to Claims 1 and 24 that upper and lower electrodes sandwich the claimed multilayer film. In contrast, in Figure 41 of Kamiguchi (relied upon by the Examiner) layers 15 and 19, shown to sandwich a multilayer film, are an underlying metal layer and a protective layer, respectively, rather than electrode layers. As such, Kamiguchi fails to teach or

disclose the claimed feature of a current flowing perpendicularly to the film plane of each layer of the multilayer film.

Amended Claim 1 further recites that the free magnetic layer comprises a plurality of magnetic layers which are laminated through a current limiting layer containing an insulating portion and a conductive portion. The insulating portion of the current limiting layer has an insulating material film having a plurality of holes extending from a top to a bottom of the current limiting layer. This plurality of holes is filled with a conductive material film serving as the conductive portion. Applicants submit that Kamiguchi fail to teach or disclose the claimed structure of the current limiting layer.

Kamiguchi et al. discloses that the "electron reflecting layer" (current limiting layer) comprises an oxide or nitride film, and pin holes are formed therein. The electron reflective layer is disposed between pinned magnetic layers. In contrast, the current limiting layer is disposed in the laminated free magnetic layer, rather than in the laminated pinned magnetic layers.

Moreover, the claimed plurality of holes is filled with a conductive material film serving as the conductive portion of the current limiting layer. In contrast, Kamiguchi is silent about the pin holes being filled with any conductive material.

For at least the above reasons, Claim 1 is allowable over Kamiguchi. Amended independent Claims 2, 13, 14, 24 and 34 are also allowable in view that they also recite the distinguishable claimed structure of the current limiting current. Their respective dependent claims are thus also allowable for at least the same reasons.

Accordingly, Applicants request that these claim rejections under 35 U.S.C. §102(a), (b) and (e) be withdrawn.

The Examiner has next rejected Claims 1, 5 – 7, 9, 11, 13, 15, 16, 18, 22, 24, 25, 27, 29, 34 and 39 – 41 under 35 U.S.C. §102(a) and/or (e) as being anticipated by Hasegawa et al. (U.S. Patent Application N0. 2002/0135956 A1).

Claim 1 recites that "the free magnetic layer comprises a plurality of magnetic layers which are laminated through a current limiting layer containing an insulating portion and a conductive portion."

Thus, the current limiting is disposed between a plurality of laminated free magnetic layers. In contrast in Hasegawa et al., the current limiting layer is formed between a free magnetic layer and an intermediate layer (paragraph 0160). Further, Hasegawa states that even in the structure in which a bias layer is provided, the intermediate layer is disposed therebetween the free magnetic layer and the bias layer (paragraph 0162). Thus, Hasegawa fails to teach or suggest the claimed arrangement of the current limiting layer as being disposed in a laminated free magnetic layer.

Hasegawa also teaches that the current limiting layer is formed on the arrival side of the free magnetic layer and on a side near a portion T2 (see figure 1 of Hasegawa) which produces the magnetoresistive effect (see Paragraph 0189). In contrast, the claimed current limiting layer is disposed directly on a portion in which the magnetoresistive effect occurs.

Accordingly, Claim 1 is distinguishable and thus allowable over Hasegawa. A similar discussion is applicable to show that independent Claims 13, 14, 24, and 34 are also allowable over Hasegawa. Thus, dependent Claims 5 – 7, 9, 11, 15, 16, 18, 22, 25, 19, and 39 – 41 are also allowable.

Claim Rejections under 35 USC §103

The Examiner has rejected Claims 17, and 19 – 21 under 35 U.S.C. §103(a) as being unpatentable over Hasegawa et al. as applied above in the claim rejections pursuant to 35 U.S.C. §102.

In regard to cancelled Claim 17, this rejection is now moot. Claims 19 – 21, directly or indirectly dependent on Claim 13 shown above to be allowable over Hasegawa, are also allowable for at least the same reasons.

The Examiner has next rejected Claims 3, 4, and 42 under 35 U.S.C. §103(a) as being unpatentable over Kamiguchi et al. as applied above in the claim rejections pursuant to 35 U.S.C. §102, and further in view of Mack et al. (U.S. Patent No. 6,462,919 B1). Kamiguchi and Mack may not be properly combined to reject Claims 3, 4, and 42.

As shown above in regard to Claims 1 and 2, Kamiguchi fails to teach or suggest the claimed arrangement of the current limiting layer. Mack is silent about claimed the current limiting layer. Claims 3, 4 and 42 are dependent on Claims 1 and 2, respectively. Thus, Claims 3, 4, and 42 may not be rejected by Kamiguchi and Mack, taken either singly or in combination with each other.

The Examiner has next rejected Claims 5, 6, and 25 under 35 U.S.C. §103(a) as being unpatentable over Kamiguchi et al. as applied above in the claim rejections pursuant to 35 U.S.C. §102, and further in view of Kishi et al. (U.S. Patent Application No. 2002/0191451 A1). Kamiguchi and Kishi may not be properly combined to reject Claims 5, 6, and 25.

As shown above in regard to Claims 1 and 24, Kamiguchi fails to teach or suggest the claimed arrangement of the current limiting layer. Kishi is silent about claimed the current limiting layer. Claims 5, 6, and 25 are dependent on Claims 1 and 24, respectively. Thus, Claims 5, 6, and 25 may not be rejected by Kamiguchi and Kishi, taken either singly or in combination with each other.

Conclusion

Therefore, in view of the above amendment and remarks, Applicants respectfully submit that this application is in condition for allowance and such action is earnestly requested. If for any reason, however, the Examiner feels that a telephone interview would be helpful in resolving any remaining issues the Examiner is respectfully requested to contact Applicant's undersigned attorney.

Respectfully submitted,



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